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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/754,379	01/09/2004	Kyung-Ju Choi	03-5AAF(DN 8676)	7769
27868	7590	10/03/2006	EXAMINER	
JOHN F. SALAZAR MIDDLETON & REUTLINGER 2500 BROWN & WILLIAMSON TOWER LOUISVILLE, KY 40202			GREENE, JASON M	
			ART UNIT	PAPER NUMBER
			1724	

DATE MAILED: 10/03/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

**Office Action Summary**

Application No.

10/754,379

Applicant(s)

CHOI ET AL.

Examiner

Jason M. Greene

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --  
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 19 June 2006.  
2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.  
3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-25 is/are pending in the application.  
4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.  
5) ☒ Claim(s) 22 is/are allowed.  
6) ☒ Claim(s) 1-6, 8-11, 15-18 and 23-25 is/are rejected.  
7) ☒ Claim(s) 7, 12-14 and 19-21 is/are objected to.  
8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.  
10) ☒ The drawing(s) filed on 09 January 2004 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).  
11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).  
a) ☐ All b) ☐ Some \* c) ☐ None of:  
1. ☐ Certified copies of the priority documents have been received.  
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.  
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- 1) ☒ Notice of References Cited (PTO-892)  
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)  
3) ☒ Information Disclosure Statement(s) (PTO/SB/08)  
Paper No(s)/Mail Date 4/12/06; 4/20/06.  
4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date. \_\_\_\_\_.  
5) ☐ Notice of Informal Patent Application  
6) ☐ Other: \_\_\_\_\_.

## **DETAILED ACTION**

### ***Response to Amendment***

### ***Response to Arguments***

1. Applicant's arguments, see page 8, line 12 to page 9, line 16, filed 19 June 2006, with respect to the rejection(s) of claim(s) 1, 2, 4-6, 9, 17, 18 and 23-25 under 35 USC 102 have been fully considered and are persuasive. Therefore, the rejection has been withdrawn. However, upon further consideration, a new ground(s) of rejection is made in view of Boothe et al. (US 3,853,529).

### ***Claim Rejections - 35 USC § 103***

2. The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

3. Claims 1, 2, 4-6, 9, 17 and 18 are rejected under 35 U.S.C. 103(a) as being unpatentable over Sundet et al. (U.S. Patent No. 6,521,011 B1) in view of Boothe et al. (US 3,853,529).

Sundet et al. '011 discloses a fluid filter including a filter frame member and a flow-through filter medium disposed therein comprising a border frame member (92,96)

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and a flow-through pleated crest filter medium (22) sized to be disposed therein, said border frame member having an inner perimeter defining a flow-through passage to receive and support said filter medium, said filter medium being in the form of spaced pleated crests to provide spaced opposed upstream (64) and downstream (32) pleated crest sets, and at least one longitudinally extending support strip (30) of selected firm support strength and preselectively controlled thickness and breadth to include spaced opposed side edges, said support strip extending adjacent at least one of said pleated crest sets of said filter medium in supporting relationship therewith, said support strip including a thin preselectively controlled thickness and breadth binding band of adhesive fastening material extending between said side edge of said support strip in primarily engaging and fastening relationship to said pleated crest of said pleated crest set, said border frame member being of disposable permanently stable cardboard (chipboard) material of U-shaped cross-section to fastenly (adhesively) receive opposed ends of said pleated crest filter medium, with said support strip extending transversely across said spaced pleated crest set (along the direction of pleating 36), said binding band being of adhesive material, opposed spaced ends of the support strip adhesively fastened to the border frame member, said filter medium having fibers treated with a selected odor or VOC removal chemical (activated carbon, adsorbents or catalysts) in Figs. 2-5 and 7 and col. 3, line 66 to col. 7, line 38.

Sundet et al. does not disclose the band of adhesive longitudinally extending the length of the support band.

Boothe et al. teaches a similar fluid filter assembly wherein the band of adhesive longitudinally extends the length of the support band and has the recited breadth in Fig. 6 and col. 2, line 31 to col. 4, line 20.

It would have been obvious to one of ordinary skill in the art at the time the invention was made to incorporate the continuous adhesive application of Boothe et al. into the filter of Sundet et al. to provide an improved connection between the support strip and the filter medium to prevent the filter medium from being urged through the spaces between the support strips by the flow of air, as suggested by Booth et al. in col. 2, line 31 to col. 4, line 20.

4. Claim 3 is rejected under 35 U.S.C. 103(a) as being unpatentable over Sundet et al. (U.S. Patent No. 6,521,011 B1) and Boothe et al. (US 3,853,529), and further in view of Sommer et al. (U.S. Patent No. 5,618,324).

Sundet et al. '011 discloses the support strip (30) having a breadth of 0.25" in col. 6, lines 15-19.

Sundet et al. '011 does not disclose the binding band being in the range of 0.03" to 0.2".

Sommer et al. discloses a similar fluid filter comprising a support strip (13,14) and a binding band, wherein the support strip and binding band have a breadth of only 0.3 mm (0.0118") to reduce the required amount of adhesive in Fig. 1 and col. 3, lines 36-44.

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It would have been obvious to one of ordinary skill in the art at the time the invention was made to slightly reduce the breadth of the binding band of Sundet et al. '011 from 0.25" (the width of the support strip) to 0.20" to reduce the amount of required adhesive, as suggested by Sommer et al. in col. 3, lines 36-44.

5. Claim 8 is rejected under 35 U.S.C. 103(a) as being unpatentable over Sundet et al. (U.S. Patent No. 6,521,011 B1) and Boothe et al. (US 3,853,529), and further in view Choi (U.S. Patent No. 6,165,244).

Sundet et al. '011 discloses the pleated crests being in the form of narrow, comparatively sharp linear fold lines in Figs. 2 and 5 and col. 4, lines 6-32.

Sundet et al. '011 does not disclose the filter medium having fibers adjacent said upstream pleated crests in alignment with the direction of the fluid stream flow and substantially normal to the pleated crests.

Choi '244 teaches a similar filter medium having fibers adjacent upstream pleated crests in alignment with the direction of the fluid stream flow and substantially normal to the pleated crests in Fig. 2 and col. 1, line 46 to col. 3, line 57.

It would have been obvious to one of ordinary skill in the art at the time the invention was made to incorporate the fiber alignment of Choi '244 into the fluid filter of Sundet et al. '011 to increase the efficiency and reduce the pressure drop of the filter medium, as suggested by Choi '244 in col. 1, lines 46-52.

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6. Claim 10 is rejected under 35 U.S.C. 103(a) as being unpatentable over Sundet et al. (U.S. Patent No. 6,521,011 B1) and Boothe et al. (US 3,853,529), and further in view of Navarre et al. (U.S. Patent No. 5,965,091).

Sundet et al. '011 does not explicitly disclose the removal chemical being a silica-alumina.

Navarre et al. discloses a similar filter medium comprising which is treated with a silica-alumina in col. 5, lines 31-49.

It would have been obvious to one of ordinary skill in the art at the time the invention was made to incorporate the silica-alumina of Navarre et al. into the filter medium of Sundet et al. '011 to provide deodorization of air passing through the filter medium, as suggested by Navarre et al. in col. 5, lines 31-49.

7. Claim 11 is rejected under 35 U.S.C. 103(a) as being unpatentable over Sundet et al. (U.S. Patent No. 6,521,011 B1) and Boothe et al. (US 3,853,529), and further in view of Homonoff et al. (U.S. Patent No. 4,765,812).

Sundet et al. '011 does not disclose the filter medium being material being dri-laid material.

Homonoff et al. teaches forming a filter medium from dri-laid (air-laid) material in col. 1, lines 39-67.

It would have been obvious to one of ordinary skill in the art at the time the invention was made to incorporate the dri-laid process of Homonoff et al. into the filter

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medium material of Sundet et al. '011 to provide a high efficiency material having a high capacity and low resistance, as suggested by Homonoff et al. in col. 1, lines 52-54.

8. Claims 15 and 16 are rejected under 35 U.S.C. 103(a) as being unpatentable over Sundet et al. (U.S. Patent No. 6,521,011 B1) and Boothe et al. (US 3,853,529), and further in view of Kahlbaugh et al. (U.S. Patent Application Publication No. US 2003/0167742 A1).

Sundet et al. '011 discloses the spaced pleats each being about 1" deep with approximately 36 spaced pleat crests per lineal 12" in col. 5, lines 26-29.

Sundet et al. '011 does not explicitly disclose the pleat depth being approximately 0.75" or approximately 12 or 14 pleat crests per lineal 12".

Kahlbaugh et al. teaches a similar filter medium having a pleat depth being approximately 0.75" with approximately 12-180 pleat crests per lineal 12" in Fig. 8A and paragraph [0034].

It would have been obvious to one of ordinary skill in the art at the time the invention was made to incorporate the pleat depth and pleat spacing of Kahlbaugh et al. into the filter medium of Sundet et al. '011 to provide a filter medium having a specific filtration area for an intended application, as is well known in the art.

9. Claims 23-25 are rejected under 35 U.S.C. 103(a) as being unpatentable over Sundet et al. (U.S. Patent No. 6,521,011 B1) in view of Boothe et al. (US 3,853,529).



Sundet et al. '011 discloses a method of forming a pleated crest fibrous fluid filter material assembly comprising the steps of feeding said fibrous material (22) in pleated crest form from a prior pleating zone (40) through a planar zone (68), said pleated crest fibrous material including spaced upstream (32) and downstream (64) longitudinally extending spaced pleated crest sets, feeding at least longitudinally extending support strip (62) into said planar zone with one face of said strip being tangentially adjacent at least one of said pleated crest sets, said support strip including longitudinally extending spaced opposed side edges of selected breadth and thickness with opposed longitudinal faces therebetween, and applying a thin longitudinally extending adhesive fastening band of preselected breadth and thickness to one of said faces of each support strip intermediate said strip edges as said strip enters said planar zone to fasten said strip to said pleated crest set in supporting relation therewith to positionally maintain said pleated crest in pleated form in said planar zone, wherein three (see Fig. 1) support strips (62) of selected breadth and thickness are fed into said planar zone transversely to and in spaced relation across said pleated crest set, each strip having an adhesive fastening band of selected breadth and thickness applied to said face adjacent said pleated crest set, said band being applied to said strip face along the central portion of said breadth of the support strip between said spaced opposed edges thereof in Figs. 1-5 and 7 and col. 3, line 66 to col. 7, line 38

Sundet et al. does not disclose the band of adhesive longitudinally extending the length of the support band.

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Boothe et al. teaches a similar fluid filter assembly wherein the band of adhesive longitudinally extends the length of the support band in Fig. 6 and col. 2, line 31 to col. 4, line 20.

It would have been obvious to one of ordinary skill in the art at the time the invention was made to incorporate the continuous adhesive application of Boothe et al. into the filter of Sundet et al. to provide an improved connection between the support strip and the filter medium to prevent the filter medium from being urged through the spaces between the support strips by the flow of air, as suggested by Booth et al. in col. 2, line 31 to col. 4, line 20.

***Allowable Subject Matter***

10. Claim 22 is allowed.

11. Claims 7, 12-14 and 19-21 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

12. The following is a statement of reasons for the indication of allowable subject matter:

With regard to claim 7, Sundet et al. teaches the support strip having a breadth of approximately 0.25" to 1" in col. 6, lines 16-19. While Sommer et al. teaches using a narrow support strip (13,14) to reduce the amount of required adhesive in col. 3, lines 36-44, the prior art made of record does not teach or fairly suggest the fluid filter frame assembly of claim 1 having a support strip of 0.625" and a binding band having a breadth of 0.09". Specifically, while one of ordinary skill in the art would recognize that the breadth of the binding band to be reduced to a value slightly less than the breadth of the support strip to save adhesive material, one of ordinary skill in the art would not be motivated to reduce the breadth of the binding band to approximately 15% of that of the support strip.

With regard to claims 12-14, Chapman teaches a filter medium comprising 25% 6 denier polyester fiber and 75% 15 denier polyester fiber and an acrylic latex binder in col. 6, lines 15-25. De Villiers et al. discloses a filter medium comprising a layer comprising 3 denier polyester fiber, 1.5 denier polyester fiber, and a bi-component 4 denier fiber in col. 5, lines 9-13.

The prior art made of record does not teach or fairly suggest the fluid filter frame assembly of claim 11 wherein the filter medium material comprises one of the specifically recited materials.

With regard to claims 19-21, the prior art made of record does not teach or fairly suggest the fluid filter frame assembly of claim 1 wherein the pleated crests include selectively spaced embossed valleys sized to snugly receive the support strips.

With regard to claim 22, Sundet et al. '011 discloses a fluid filter including a filter frame member and a flow-through filter medium disposed therein comprising a border frame member (92,96) and a flow-through pleated crest filter medium (22) sized to be disposed therein, said border frame member having an inner perimeter defining a flow-through passage to receive and support said filter medium, said filter medium being in the form of spaced pleated crests to provide spaced opposed upstream (64) and downstream (32) pleated crest sets, and at least one longitudinally extending support strip (30) of selected firm support strength and preselectively controlled thickness and breadth to include spaced opposed side edges, said support strip extending adjacent at least one of said pleated crest sets of said filter medium in supporting relationship therewith, said support strip including a thin preselectively controlled thickness and breadth binding band of adhesive fastening material extending between said side edge of said support strip in primarily engaging and fastening relationship to said pleated crest of said pleated crest set, said border frame member being of disposable permanently stable cardboard (chipboard) material of U-shaped cross-section to fastenly (adhesively) receive opposed ends of said pleated crest filter medium, with said support strip extending transversely across said spaced pleated crest set (along the direction of pleating 36), said binding band being of adhesive material, opposed spaced

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ends of the support strip adhesively fastened to the border frame member, said filter medium having fibers treated with a selected odor or VOC removal chemical (activated carbon, adsorbents or catalysts) in Figs. 2-5 and 7 and col. 3, line 66 to col. 7, line 38. Sundet et al. '011 discloses the pleated crests being in the form of narrow, comparatively sharp linear fold lines in Figs. 2 and 5 and col. 4, lines 6-32.

Choi '244 teaches a similar filter medium having fibers adjacent upstream pleated crests in alignment with the direction of the fluid stream flow and substantially normal to the pleated crests in Fig. 2 and col. 1, line 46 to col. 3, line 57.

It would have been obvious to one of ordinary skill in the art at the time the invention was made to incorporate the fiber alignment of Choi '244 into the fluid filter of Sundet et al. '011 to increase the efficiency and reduce the pressure drop of the filter medium, as suggested by Choi '244 in col. 1, lines 46-52.

Sommer et al. discloses a similar fluid filter comprising a support strip (13,14) and a binding band, wherein the support strip and binding band have a breadth of only 0.3 mm (0.0118") to reduce the required amount of adhesive in Fig. 1 and col. 3, lines 36-44.

It would have been obvious to one of ordinary skill in the art at the time the invention was made to slightly reduce the breadth of the binding band of Sundet et al. '011 from 0.25" (the width of the support strip) to 0.20" to reduce the amount of required adhesive, as suggested by Sommer et al. in col. 3, lines 36-44.

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Kahlbaugh et al. teaches a similar filter medium having a pleat depth being approximately 0.75" with approximately 12-180 pleat crests per lineal 12" in Fig. 8A and paragraph [0034].

It would have been obvious to one of ordinary skill in the art at the time the invention was made to incorporate the pleat depth and pleat spacing of Kahlbaugh et al. into the filter medium of Sundet et al. '011 to provide a filter medium having a specific filtration area for an intended application, as is well known in the art.

Chapman teaches a filter medium comprising 25% 6 denier polyester fiber and 75% 15 denier polyester fiber and an acrylic latex binder in col. 6, lines 15-25. De Villiers et al. discloses a filter medium comprising a layer comprising 3 denier polyester fiber, 1.5 denier polyester fiber, and a bi-component 4 denier fiber in col. 5, lines 9-13.

The prior art made of record does not teach or fairly suggest the air filter frame assembly of claim 22 wherein the filter medium material comprises one of the specifically recited materials, wherein said fibers are treated with an acetic acid vinegar odor removal, and wherein the support strip has a breadth of approximately of 0.625" and the binding band has a breadth of 0.09".

### ***Conclusion***

13. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP

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§ 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).


A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

14. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Jason M. Greene whose telephone number is (571) 272-1157. The examiner can normally be reached on Monday - Friday (9:00 AM to 5:30 PM).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Duane Smith can be reached on (571) 272-1166. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

Jason M. Greene  
Primary Examiner  
Art Unit 1724

  
9/17/06

jmg  
September 17, 2006